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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/569,552	02/27/2006	Yoshimasa Hashimoto	OGW0423	7758
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Patrick G. Burns Greer, Burns & Crain, Ltd. Suite 2500 300 South Wacker Drive Chicago, IL 60606				
EXAMINER				
MAKI, STEVEN D				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/569,552

Applicant(s)

HASHIMOTO ET AL.

Examiner

Steven D. Maki

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CIS) Paper No(s)/Mail Date 09/02/08
- 4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

1) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3) **Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Beckmann et al (US 5,350,001).**

Beckmann et al discloses a vehicle tire having a tread comprising land portions. The land portions may be blocks or ribs. Incisions are disposed in each land portion. The incision is formed using an embossed lamella metal sheet having a thickness of 0.4 mm to 0.8 mm (col. 5 lines 11-13). Therefore, the incisions have a width of 0.4 mm to 0.8 mm. Such incisions are also described by one of ordinary skill in the art as "sipes". In the embodiment of **Figures 1a and 1b**, the lamella sheet has bending lines 3. Each bending line defines a waveform. The embossing depth p (amplitude p) in the direction normal to the longitudinal direction of the incision is 0.5 mm to 3.0 mm (col. 5 lines 9-11). The direction normal to the longitudinal direction of the incision is the tire circumferential direction when the longitudinal direction of the incision is at an angle of zero degrees with respect to the axial direction. The bending angle gamma is 150-90

degrees such as 120 degrees (Figure 1b, col. 5 lines 1-6). An angle gamma of 120 degrees corresponds to a "tilt angle" (claim 2) of 30 degrees. Beckmann et al illustrates a distance B and discloses "B" as being the minimum mutual spacing resulting from the above noted displacement of the waveforms (Figure 1a, col. 4 lines 62-64). Beckmann et al teaches that B is 0.5 to 3 mm (col. 4 lines 63-64). In other words, distance "B" is the shortest *spacing* between one point on one waveform and another point on another adjacent waveform wherein $B = 0.5 \text{ to } 3 \text{ mm}$. Beckman et al illustrates a distance C and discloses "C" as being the amount of displacement of the waveforms relative to each other (Figure 1a, col. 4 lines 61-62). In other words, distance "C" is the *spacing* in the radial direction between one point on one waveform and another point on another adjacent waveform. Therefore, distance C and distance B describe the *spacing* between one point on one waveform and another point on another waveform wherein the minimum value of the *spacing* is 0.5 to 3 mm. Beckmann et al illustrates an amplitude A as being the distance between a trough and a peak of a waveform (Figure 1a). Beckmann et al teaches that the amplitude A is $C/2$ to $3C$ (col. 4 lines 65-67). Therefore, the *minimum* amplitude A in the radial direction in the embodiment of Figure 1a, 1b is 0.25 mm to 1.5 mm when the *spacing* between the waveforms is *constant* ($B = C = 0.5 \text{ mm}$; $0.5 \text{ mm} / 2 = 0.25 \text{ mm}$; $0.5 \text{ mm} \times 3 = 1.5 \text{ mm}$). The range of "0.25 to 1.5 mm" overlaps the claimed range of 0.5 to 5.0 mm. Before addressing other figures, Beckmann et al states:

In the event that hereinafter in the description of the following exemplary embodiments, nothing is different is mentioned, then, the aforementioned dimensions regarding the spacing between adjacent bending lines, the

embossing depth and the thickness of the lamella sheet are also valid for these variants.

In the embodiment of **Figures 3a and 3b**, the lamella sheet is defined by bending lines 3" and bending lines 4". The resulting lamella sheet (figure 3b) defines a zigzag shape with an embossing depth p (amplitude p) in the directional normal to the longitudinal direction of the incision and a zigzag shape with an amplitude C" in the radial direction. The sipe made by the lamella sheet embodiment of Figure 3a and 3b is a "3-D sipe". Beckmann et al describes each of Figures 1a and 3a as being a "top plan view". Beckmann et al describes each of Figures 1b and 3b as being an "axonometric view". In view of Beckmann et al's description of each of Figures 1b and 3b as being an "axonometric view", one of ordinary skill in the art would readily understand the Y-axis (radial direction) and X-axis (longitudinal direction) in Figures 1b and 3b as having the same proportional ratio whereas the Z-axis (direction of embossing depth p) is at a different scale. Beckmann et al teaches the tire has improved travel characteristics such as improved handling as well as wear characteristics like break outs and irregular wear (abstract, col. 2 lines 59-64). Beckmann et al also teaches that the walls of the incisions can only slide off each other with difficulty which as the consequence that energy is converted into heat through friction and slid is reduced (col. 8 lines 5-9).

As to claim 1, the claimed tire is anticipated by Beckmann et al's tire having sipes in blocks made using the lamella sheet embodiment of Figures 3a and 3b. It is noted for example that Figure 3a of Beckmann et al corresponds to Figure 8a of applicant's disclosure. The bent portions are anticipated by the portions of the sipe defined by the zigzag bending lines 3" (Figure 3b). As can be seen from figure 3b, bending lines 3"

exist at least two positions in the radial direction. One of ordinary skill in the art would have readily understood that the vehicle tire is a pneumatic tire. In any event, it would have been obvious to one of ordinary skill in the art to form Beckmann et al's sipes shaped by the lamella embodiment of Figures 3a and 3b in each of blocks of a tread of *a pneumatic tire* such that the sipes *extend in the tire widthwise direction for example at angle of 0 degrees with respect to the axial direction of the tire* since (1) Beckmann et al teaches forming 3-D incisions (3-D sipes) in blocks of a tread of a *vehicle tire* using lamella sheets such as that shown in Figure 3b to improve handling, reduce skid and suppress wear, (2) Beckmann et al teaches providing the sipes such that they *extend generally in the transverse direction* (col. 7 lines 63-66) and (3) it is taken as well known / conventional per se in the tire art to form sipes in each of blocks defined by circumferential and transverse grooves of a tread of a pneumatic tire such that the sipes extend in the widthwise direction (transverse direction) for example at an angle of 0 degrees with respect to the axial direction of the tire so that the pneumatic tire has improved anti-skid / braking properties.

When considered as a whole, Beckmann et al suggests forming incisions (sipes) using the embodiment of Figures 3a, 3b such that an amplitude in the radial direction is within the claimed range of 0.5 to 5 mm. Beckmann et al's of sheet thickness = 0.4 to 0.8 mm, spacing B = 0.5 to 3.0 mm and amplitude A = C/2 to 3C as described with respect to Figures 1a, 1b apply to the embodiment of figures 3a, 3b. See col. 5 lines 14-20. With respect Figure 3a of Beckmann et al, applicant states and examiner agrees that "... the value of C is given by the equation ($C = B / \sin(\alpha)$). See page 8 of

response filed 6-3-08. The trapezoidal shape defining angle α'' in Figure 3a limits angle α'' to being an acute angle between the range of 0 and 90 degrees. If angle α'' is varied between 10 and 80 degrees when using distance B of 0.5 mm and applicant's equation of $C = B / \sin(\alpha'')$, the distance C varies from 0.51 mm to 2.94 mm as shown below:

angle α''	B (min spacing)	$\sin(\text{angle } \alpha'')$	$C = B / (\sin(\text{angle } \alpha''))$
10	0.5 mm	0.17	2.94 mm
20	0.5 mm	0.34	1.47 mm
30	0.5 mm	0.50	1.00 mm
40	0.5 mm	0.64	0.78 mm
50	0.5 mm	0.77	0.65 mm
60	0.5 mm	0.86	0.58 mm
70	0.5 mm	0.94	0.53 mm
80	0.5 mm	0.98	0.51 mm

As noted above, Beckmann et al teaches that the amplitude A is not smaller than $C/2$ and is not greater than $3C$. When amplitude $A = C/2$ (the lower end point), the range of 0.51 mm to 2.94 mm for C results in a range of 0.26 mm to 1.5 mm for amplitude A. The range of 0.26-1.5 mm overlaps the claimed range of 0.5 to 5.0 mm. When amplitude $A = 3C$ (the upper end point), the range of 0.51 mm to 2.94 mm results in a range of 1.5 mm to 8.8 mm for amplitude A, which again overlaps the claimed range of 0.5 to 5.0 mm. In figure 3a, the illustrated angle α'' is 35 degrees. At the illustrated angle α'' of 35 degrees and Beckmann et al's disclosed end point of 0.5 mm for B, the value of C is 0.88 mm ($B = 0.5 \text{ mm}$, $\alpha'' = 35 \text{ degrees}$ $C = B / \sin(\alpha'') = 0.5 / \sin(35$

degrees) = $0.5 \text{ mm} / 0.57 = 0.88 \text{ mm}$). At the illustrated angle α'' of 35 degrees and Beckmann et al's disclosed end point of 3 mm for B, the value of C is 5.3 mm ($B = 3 \text{ mm}$, $\alpha'' = 35 \text{ degrees}$ $C = B / \sin(\alpha'') = 3 \text{ mm} / \sin(35 \text{ degrees}) = 3 \text{ mm} / 0.57 = 5.3 \text{ mm}$). Thus, the distance C for the incisions (sipes) made using the embodiment of figures 3a, 3b at the illustrated angle of 35 degrees is 0.88 to 5.3 mm. When $A = C / 2$ (the lower end point), the range of 0.88 mm to 5.3 mm for C results in a range of 0.44 mm to 2.7 mm for amplitude A. The range of 0.44 mm to 2.7 mm overlaps the claimed range of 0.5 to 5.0 mm. When amplitude $A = 3C$ (the upper end point), the range of 0.88 mm to 5.3 mm results in a range of 2.6 mm to 16 mm for amplitude A, which again overlaps the claimed range of 0.5 to 5.0 mm. In light of the above analysis, Beckmann et al is considered to disclose with sufficient specificity, an amplitude in the radial direction within the claimed range of 0.5 to 5.0 mm. In any event: it would have been obvious to one of ordinary skill in the art to form sipes (incisions) according to Beckmann et al's embodiment of Figures 3a, 3b such that the *amplitude in the radial direction is within the claimed range of 0.5 to 5.0 mm* in view of (1) Beckmann et al's teaching that the amplitude A" is not smaller than $C''/2$ and is not greater than $3C''$, (2) Beckman et al's teaching that the minimum spacing B" between the waveforms is 0.5 to 3.0 mm, (3) the illustrated relationship between distance B" and distance C" (e.g. $C = B / \sin(\alpha'')$), which provides one of ordinary skill in the art general guidance as to the relationship between the dimensions (e.g. B", C", A") of the 3-D metal sheet used to form the 3-D sipes (3-D incisions) and (4) Beckmann et al's teaching that a tire having incisions (sipes) made using the disclosed 3-D metal sheets has improved handling,

reduced skid and reduced irregular wear. With respect to the drawings conveying information, it is again that Beckmann et al describes each of Figures 1a and 3a as being a "top plan view" and each of Figures 1b and 3b as being an "axonometric view" (two of the three dimensions have the same proportional ratio).

As to claim 2, Beckmann et al teaches an angle gamma of 90-150 degrees such as 120 degrees. An angle gamma of 120 degrees corresponds to a tilt angle of 30 degrees. Thus, Beckmann et al teaches using a "tilt angle" for the Figure 3a, 3b embodiment within the claimed range of 10-45 degrees.

4) Claims 3-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beckmann et al (US 5,350,001) as applied above and in view of Lagnier 965 (US 4,794,965) and Lagnier 002 (US 5,783,002).

As to claims 3-5, it would have been obvious to one of ordinary skill in the art to provide Beckmann et al's figure 3b embodiment such that the amplitude in the tire circumferential direction is constant, the tilt angle is smaller closer to the bottom of the sipe and the amplitude in the radial direction is larger closer to the bottom of the sipe since (1) Lagnier 965, also directed to sipes for a tire tread, suggests retaining a constant circumferential distance or amplitude "a", decreasing angle theta as a function of depth and increasing the pseudo-wavelength lambda as a function of depth of a sipe zigzag trace extending in the radial direction (Figure 3C) to regulate rigidity and obtain greater uniformity of wear and (2) Lagnier 002, also directed to sipes for tire treads, teaches using a constant amplitude lambda A for a zigzag trace of a 3-D incision (3-D sipe) extending in the transverse direction of a tire and varying the wavelength lambda

B of a sipe zigzag trace extending in the radial direction (depth direction). See column 4 of Lagnier 002. It is noted that the zigzag trace shown in Figure 3C of Lagnier directly corresponds to the zigzag trace defined by bending line 4" of Beckmann et al. It is noted that the amplitude in the radial direction of bending line 3" increases as the wavelength of bending line 4" increases. The claimed tilt angles (claim 4) and amplitudes in radial direction (claim 5) would have been obvious in view of (1) the "tilt angle" and "amplitude in radial direction" suggested by Beckmann et al and (2) Lagnier 965's teaching to decrease angle theta and increase pseudo-wavelength lambda to regulate rigidity and obtain greater uniformity of wear. With respect to suitable tilt angles, Beckmann et al teaches angle gamma of 90-150 degrees such as 120 degrees. An angle gamma of 120 degrees corresponds to a tilt angle of 30 degrees.

As to claims 6-9, it would have been obvious to one of ordinary skill in the art to provide Beckmann et al's figure 3b embodiment such that the intervals between the bent portions in the radial direction are set uniform and the amplitude in the tire circumferential direction is set smaller closer the bottom of the sipe since (1) Lagnier 965, also directed to sipes for a tire tread, suggests using uniform intervals lambda and *decreasing circumferential distance or amplitude "a"* as a function of depth for a sipe zigzag trace extending in the radial direction (depth direction) (Figure 3A) to regulate rigidity and obtain greater uniformity of wear and (2) Lagnier 002, also directed to sipes for tire treads, teaches *varying amplitude lambda B of a zigzag trace of a 3-D sipe extending in the radial direction (depth direction)*. See column 4 of Lagnier 002. It is noted that the zigzag trace shown in Figure 3A of Lagnier directly corresponds to the

zigzag trace defined by bending line 4" of Beckmann et al. The claimed distance (claim 7), larger angle for auxiliary line (claim 8) and distances (claim 9) would have been obvious in view of Lagnier 965's teaching to decrease circumferential distance or amplitude a as a function of depth to regulate rigidity and obtain greater uniformity of wear.

5) Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beckmann et al (US 5,350,001) in view of Lagnier 965 (US 4,794,965) and Lagnier 002 (US 5,783,002) as applied above and further in view of Japan 511 (JP 09-323511).

As to claims 10 and 11, it would have been obvious to one of ordinary to provide Beckmann et al's blocks with the claimed shallow grooves since Japan 511 suggests using auxiliary sipes 11 having a depth less than 1.5 mm and zigzag sipes in blocks of a tire tread to improve performance on ice. The description of "vertical portion extending on a normal line direction" fails to define structure not suggested by the applied prior art. In particular, "vertical portion extending on a normal line to the tread surface is provided to the sipe in a section where the sipe joins to the tread surface" fails to require walls of the sipe to be oriented at 90 degrees to the tread surface.

6) Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beckmann et al (US 5,350,001) in view of Lagnier 965 (US 4,794,965) and Lagnier 002 (US 5,783,002) as applied above and further in view of Japan 511 (JP 09-323511) and Japan 916 (JP 2002-192916).

As to claims 10 and 11, it would have been obvious to one of ordinary to provide Beckmann et al's blocks with the claimed shallow grooves since Japan 511 suggests using auxiliary sipes 11 having a depth less than 1.5 mm and zigzag sipes in blocks of a tire tread to improve performance on ice. Furthermore, it would have been obvious to one of ordinary skill in the art to provide the sipes made using Beckmann et al's figure 3a, 3b embodiment with the claimed "vertical portion extending on a normal line direction" in view of Japan 916's disclosure of a "vertical portion" connecting the tread surface with sipe zigzag trace extending in the radial direction (figure 2, 4b)

Remarks

- 7) Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.
- 8) No claim is allowed.
- 9) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven D. Maki/
Primary Examiner, Art Unit 1791

Steven D. Maki
October 13, 2008